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Ontario Department of Education

SYLLABUS

OF

SUMMER COURSES AND EXAMINATIONS

FOR

The Elementary Certificate Type A

IN

Manual Training

1939

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COURSE OF STUDY LEADING TO THE ELEMENTARY MANUAL TRAINING CERTIFICATE, TYPE A

1. **Length of Course:**

The course to consist of two parts, of 200 clock hours each. Part I to be taken before Part II.

2. **Object of the Course.**

To provide training for the teaching of Shop Work (part-time) in the smaller High Schools and Continuation Schools.

Note:—The Elementary Certificate, Type A, is accepted as meeting the requirements for admission to the one year course at the Ontario Training College for Technical Teachers leading to the Intermediate Certificate.

3. **Requirements for Admission.**

(a) An Interim High School Assistant's Certificate, or

(b) An Interim First Class Certificate.

Notes:—(a) Applicants who satisfactorily complete the prescribed manual training courses in Grades IX and X and the shop work option at the College of Education to be admitted to Part II.

(b) Applicants who hold the Elementary Manual Training Certificate, Type B to be admitted to Part II.

4. **Applications for Admission.**

To be made on an official form to be obtained from the Deputy Minister.

SUBJECTS OF STUDY

In both Parts of the course, tools, machines and materials to be studied at the time of use to the extent necessary for the performance of the work.

PART I

1. Drafting—25 Hours

Outlines, dimension lines, hidden outlines, centre lines, arrow heads, smybols; plain stroke freehand lettering; two and three view drawings of simple rectangular objects, angular objects, cylindrical objects; sectional views; shop sketching and blue print reading; scale—full size, quarter size; dimensioning; pictorial representation.

2. Woodwork—75 Hours.

A. **Bench Tool Operations**—laying out, sawing, planing, squaring, chamfering, chiselling, shaping, boring, fastening, sanding.

B. **Machine Tool Operations**—safety practices; cross-cutting, ripping, bandsawing, jointing edges, rough and finish turning, turning beads and curves, grinding chisels and plane irons, sanding.

C. **Wood Finishing**—filling, staining (oil), shellacking, waxing, painting, enamelling; care of brushes and materials.

D. **Lumber**—recognition of common native woods, characteristic defects; units of measurement, stock sizes.

3. METALWORK—50 Hours

A. **Forge and Vise Work,** the fire, building, coking, cleaning, controlling temperature; forging round to square, square to round, drawing, tapering, bending, twisting, hot and cold cutting, applied to simple objects such as staple's, tangs, hooks, eyes, wedges, hardening and tempering, applied to a turned punch.

Vise work: See Machine Shop Practice, Bench operations.

B. **Machine Shop Practice—**

(i) **Bench operations** — laying out using steel rule, dividers, scriber, hermaphrodite caliper, try square, centre punch; cutting with hack saw and chisel; filing; centering; hand drilling, countersinking; riveting; finishing; tapping a through hole, threading.

(ii) **Machine tool operations**—safety practices; mounting work between centres on lathe, invise on drill press; mounting cutting tools; rough and finish turning, side facing, shoulder turning; drilling; use of cooling and cutting compounds; rough grinding; polishing.

C. **Ornamental Metal Work**—cutting, bending, twisting, drilling, countersinking, riveting, soldering, applied to simple objects made of strap and bar iron, copper, brass; laying out, transferring patterns; raising; sinking, matting, piercing; annealing; etching, polishing, cleaning, painting, lacquering.

D. **Sheet Metal Work**—laying out, cutting, folding and forming simple rectangular objects of galvanized sheet iron and tinned iron; soldering; protective and decorative finishing.

4. MOTOR MECHANICS—25 Hours

A series of shop jobs to give a general idea of—the chassis and its units; the frame, springs and spring mountings; tires, road wheels and bearings; the front axle and steering gear; principal engine parts, the four-stroke cycle; engine lubrication; a fuel system; a cooling system; single-plate clutch; a simple gear box; a rear axle; bolt and thread specifications.

5. APPLIED ELECTRICITY—25 Hours

Simple bell and annunciator circuits, commercial circuits in knob-and-tube construction, Hydro Electric rules, testing circuits; circuit protection and the simple fuse; making joints as required, soldering, weather-proofing; permanent and electro-magnets, the magnetic field, polarity; a qualitative comparison of common conductors, carrying capacities related to size; insulators.

6. FARM MECHANICS

To meet the needs of teachers in schools serving rural areas work included in the foregoing paragraphs to be related to jobs commonly found about the home and on the farm. Further special instruction in Farm Mechanics to be provided in Part II.

7. ORGANIZATION AND METHODS

To be covered incidentally in Part I. A detailed discussion of this topic included in Part II.

8. SHOP PRACTICE

The strict observance of safety practices and shop routines; the proper use and care of tools, machines, and materials; general shop attitude. The student to be rated A, B, C, or D, in each shop subject. The final sessional mark to be the valuation of the term's work adjusted by the shop practice rating according to the plan shown herewith:

Shop practice rating A—the valuation of the term's work multiplied by 1.0

Shop practice rating B—the valuation of the term's work multiplied by 0.9.

Shop practice rating C—the valuation of the term's work multiplied by 0.8.

Shop practice rating D—the valuation of the term's work multiplied by 0.7.

STANDING OF STUDENTS

The final standing of the students will be determined by:

(1) Valuation of term's work adjusted by the shop practice ratings under the following headings—

	Maximum	Minimum
Drafting	100	60
Woodwork	100	60
Metalwork	100	60
Motor Mechanics	100	60
Applied Electricity	100	60

(2) Examinations in—

	Maximum	Minimum
Drafting	100	50
Woodwork	100	50
Metalwork	100	50
Motor Mechanics	100	50
Applied Electricity	100	50

PART II

1. DRAFTING—25 Hours

Detail and assembly drawings to include machine drawings of simple mechanical objects involving threads, tapped holes, countersunk holes, sections; simple problems in orthographic projection; development of surfaces (parallel and radial line).

2. WOODWORK—50 Hours

A. Bench Tool Operations—further experiences in the operations covered in Part I, routing, dadoing, scraping, saw filing.

B. **Machine Tool Operations**—[illegible]s; rabbetting, dadoing, scroll work, jointing faces, shoulder and taper turning, face plate work, routing, shaping, mortising.

C. **Wood Finishing**—staining (water), varnishing, rubbing, polishing.

3. METALWORK—50 Hours

A. **Forge and Vise Work**—the operations of Part I, upsetting, punching, forming, swaging, welding, applied to splice plates, rings, links, eye-bolts, punches, chisels; heat-treating of high and low carbon steels, annealing, hardening, quenching, tempering (the colour scale), case hardening.

Vise Work: see Machine Shop Practice, Bench Operations.

B. **Machine Shop Practice—**

(i) **Bench Operations**—the operations of Part I; laying out using surface gauge; cold bending and twisting; finishing with abrasives; tapping a blind hole, threading, adjusting die, national standard threads.

(ii) **Machine Tool Operations**—safety practices; operations of Part I; mounting work in chuck (independent) on V block for drilling; knurling; cutting tapers; grinding to size, tool grinding.

C. **Ornamental Metal Work**—The operations of Part I applied to more difficult objects made of strap and bar iron, copper, brass, aluminum, use of soft and hard solders.

D. **Sheet Metal Work**—The operations of Part I applied to more difficult rectangular objects and to circular objects; cutting, folding, locking, rolling, wiring, turning, burring, beading, grooving, on the foot squaring sheers, brake, bar folder, slip roll former, wiring, burring and turning machine, beader and groover; safety practices.

4. MOTOR MECHANICS—25 hours

The study of the units included in Part I extended to the multi-cylinder engine, valve arrangement and adjustment, firing order; simple carburetion; an electrical system, ignition timing and distributor wiring; the differential and drive gears, a braking system.

5. APPLIED ELECTRICITY—25 hours

Circuits with dry cells to study effects of arranging dry cells in series, parallel and series—parallel; circuits with variable loads arranged in series and in parallel; signal circuits with two or more controls, a return call system, ground return system; branch lighting circuits in knob-and-tube and non-metallic sheathing, the three-way switch; a 30 ampere service; simple commercial applications of magnets and induced currents; use of D.C. ammeters and voltmeters to establish concepts of amperes, volts, ohms, and watts; calculation of current consumption of an appliance verified experimentally.

6. FARM MECHANICS—20 Hours

Instruction included in the preceding paragraphs to be planned to meet the needs of teachers in schools serving rural areas. In addition, instruction to be offered in the topics listed under this section.

Belt Lacing and Leatherwork—single and double lacing of leather and fabric belts; harness repairing, sewn and riveted joints, the scarf joint, attaching snaps and buckles.

Concrete Work—tests of aggregates and mixes; simple forms; mixing and placing concrete.

Pipe Fitting—measuring, cutting, reaming, threading and sealing black and galvanized iron pipe; use of couplings, elbows, tees, reducers; standard iron pipe threads.

Rope Work—knots in common use on the farm; the crown and tuck; the eye, loop, short and long splices.

7. ORGANIZATION AND METHODS—5 Hours

Brief discussion of problems of shop organization and administration, equipment, shop plans; the special method of teaching shop work, instructional material; government grants and regulations.

8. SHOP PRACTICE

The strict observance of safety practices and shop routines; the proper use and care of tools, machines, and materials; general shop attitude. The student to be rated A, B, C, or D, in each shop subject. The final sessional mark to be the valuation of the term's work adjusted by the shop practice rating according to the plan shown herewith:

Shop practice rating A, the valuation of the term's work multiplied by 1.0.
Shop practice rating B, the valuation of the term's work multiplied by 0.9.
Shop practice rating C, the valuation of the term's work multiplied by 0.8.
Shop practice rating D, the valuation of the term's work multiplied by 0.7.

STANDING OF STUDENTS

The final standing of the students will be determined by—

(1) Valuation of term's work adjusted by the shop practice ratings under the following headings.

	Maximum	Minimum
Drafting	100	60
Woodwork	100	60
Metalwork	100	60
Motor Mechanics	100	60
Applied Electricity	100	60
Farm Mechanics	100	60

(2) Examinations in:

	Maximum	Minimum
Drafting	100	50
Woodwork	100	50
Metalwork	100	50
Motor Mechanics	100	50
Applied Electricity	100	50
Farm Mechanics	100	50